

Study the impact of the global crisis on stock prices and liquidity in the stock market

Sahar M. R. Mahran⁺

Dept Business Administration Facu Commerce , Ain shames Univ., Cairo, Egypt
Facu. Econ. Admin., - King Abdullaziz Univ., Jeddah, KSA

Abstract. The object of this study is to analyze the impact of the 2008 global crisis on prices and liquidity of stocks in the Egyptian stock market. That was achieved through comparing the prices and the level of liquidity before and after the crisis using Paired-Sample T-Test as statistical approach. The results showed that the sectors most affected by the global crisis are as building and construction, cement, spinning and weaving, financial, service sectors. Since these sectors showed a significant difference in both price and liquidity between two periods (before and after crisis) at significance level 5%. While some other sectors showed a significant difference only in the average price but no significant differences in liquidity, such as heavy industry, food industry and electronic supplies sectors. In addition there are some sectors showed no significant differences in both price and liquidity between two period (before and after crisis), such as agriculture and chemical industries sectors. However the agriculture sector showed increased in both price and liquidity after the global crisis but it was not significant.

Keywords: global crisis, stock price, liquidity, stock market, economical sectors, Egyptian stock market

1. Introduction

The global economic crisis that began in 2008 has introduced similar circumstances of economic hardship to all corners of the world. **Campello (2010)** saw that the recent 2008 crisis has proved that the financial system was not able to withstand the stresses that came about with an increase in the size and dispersion of global imbalances and the associated capital flows. Also Many Researchers studied how the financial crisis evolved, for example **Spence(2009)** who believed that the housing bubble part, based on the Case-Shiller index, which peaked in 2006. This housing bubble existed in different parts of the world, particularly in Europe, also The American banks were highly levered, the other financial institutions—the investment banks and brokers were very highly leveraged, and interestingly, the European banks were even more highly leveraged, and, there's a huge transparency problem. **Büyükkarabacak and Valev (2010)** confirm the pervious view ,they emphasize that household credit expansions have been a statistically and economically significant predictor of banking crises. Consequently, it was noticeable that the last crisis case by financial risk and systemic risk that happened in the simultaneous time. In addition **Ducaa,et al.(2010)** saw that unsustainable weakening of credit standards induced a US mortgage lending and housing bubble, whose consumption impact was amplified by innovations altering the collateral role of housing. In countries with more stable credit standards, any overshooting of construction and house prices owed more to traditional housing supply and demand factors. While **Agnello and Schuknechte (2011)** study the characteristics and determinants of booms and busts in housing prices for a sample of eighteen industrialized countries over the period 1980–2007. They found that domestic credit and interest rates have a significant

⁺ Corresponding author. Tel.: 00966559981696
E-mail address: sahar_mahran@yahoo.com

influence on the probability of booms and busts occurring. Moreover, international liquidity plays a significant role for the occurrence of housing booms and—in conjunction with banking crises—for busts.

2. Literature review

Many literature studied the effects of the crisis on the capital markets, financial system in developed and developing countries, **Phylaktis and Ravazzolo (2008)** reported that the long-run and short-run dynamics between stock prices and exchange rates and the channels through which exogenous shocks impact on these markets over the period 1980-1998. The evidence suggests that stock and foreign exchange markets are positively related and that the US stock market acts as a conduit for these links. Main while **Kenc, and Dibooglu (2009)** found that the real estate market in the US, the complex securities became highly illiquidity. Illiquidity in the housing market created information risk, which coupled liquidity for asset-backed securities in complexity risk, destroyed financial markets Because of the inter connectedness in the global financial system,, the crisis spread quickly and is producing the largest global downturns in recent memory . **Claessens, et al. (2010)** done a brief analysis of three major questions which are: How the global financial crisis similar? How different? How costly? First they argue that the crisis (2008-2009) has some close similarities to earlier ones, including the presence of credit and asset price booms fueled by rapid debt accumulation. Second it has some significant differences, such as the explosion of opaque and complex financial instruments in a context of highly integrated global financial markets. Third, although the latest episode took a very heavy toll on the real economy, they argue that this was not a surprising outcome. In addition **Szafarz (2012)** found that when a financial crisis breaks out, speculators typically get the blame whereas fundamentalists are presented as the safeguard against excessive volatility, and efficient markets are more volatile with a few speculators than with many speculators. Regulators should therefore be aware that efforts to limit rational speculation might, surprisingly, end up increasing volatility.

Lim, et al. (2008) investigated the effects of the 1997 financial crisis on the efficiency of eight Asian stock markets, also they tested statistics for the three sub-periods (pre-crisis, crisis, and post-crisis). The results demonstrate that the crisis adversely affected the efficiency of most Asian stock markets, the present findings of higher inefficiency during the crisis are not surprising as in the chaotic financial environment at that time, investors would overreact not only to local news, but also to news originating in the other markets, especially when the news events were adverse. Also **Bowe and Domuta (2004)** used Jakarta Stock Exchange (JSX) data to analyze the investment patterns of foreign and domestic investors for evidence of herding and positive feedback trading before, during, and after the 1997 Asian crisis. Results indicate that both investor classes herd, foreigners Consequently herd more than locals, and foreign herding increases following the onset of the crisis. While **Aroskara et al. (2004)** investigates the impact on foreign exchange market efficiency of the 1992 European financial market crisis by studying pre-crisis, crisis, and post- crisis periods. Long-term relationships among European currency values are identified during the three periods, although the relationships are not stable during the pre-crisis and the post-crisis periods. These results may be due to one or more of the following: (1) market inefficiency, (2) a risk premium, or (3) common policy guidelines for European monetary system (EMS) members' .

Peterson, et al. (2010) studied how the poor and the non-poor in a developing country think about the effects of market changes after an economic crisis .Consumers living below the Turkish poverty line , although not within the(UN)defined ranks of the global _poor tend to see their place in the market in a manner similar to subsistence consumers. While **Yuan et al. (2010)** discussed the influence on energy consumption and economic growth of Global Financial Crisis and the stimulus plan against it by input–output analysis. The results show that the fall of exports caused by the global financial crisis will lead to a decrease of 7.33% in GDP (Gross Domestic Production) and a reduction of 9.21% in energy consumption, so The Global Financial Crisis will impact the economic growth violently. While **Dufrénota et al. (2011)** found that the financial stress in the US markets is transmitted to the LAC's stock market volatility, especially in Mexico. In addition **Pained(2011)** studied which firms were suffered from global crisis. He found that the crisis led many firms to stop ongoing innovation projects. The results show that firms with access to public funding were less likely to abandon these investments. Younger firms and businesses

supplying foreign multinationals or suffering export shocks were more likely to do so. Consequently the longer term impact of the global crisis depends on how business innovation capacities were affected.

3. Methodology

3.1. The research community and sample

Research community is consists of 233 institutions that issue stocks in the Egyptian stock market. While sample taken approach is a random sample, which selected of 81 institutions (representing 45% of research community) representative of all sectors, the distribution ratios of the institutions in the sample are the same distribution ratios of sectors in the research community as evidenced by the following table (1).

Table (1) the institutions in the community sectors and in the research sample:

Sectors	Total institutions	Ratio in community	Institutions in sample
1- Banks & Financial Services	24	0.10	12
2- Construction	40	0.17	13
3- Chemical industries	31	0.13	10
4- Cement	24	0.10	8
5- Spinning and Weaving	16	0.07	5
6- Agriculture	8	0.04	3
7- food industries	23	0.10	7
8- mills	14	0.06	8
9- services sectors	36	0.16	13
10- electronic and electrical sector	9	0.04	2
11- Heavy industry	10	0.05	4
Total	233	1	81

3.2. Research time frame

By using monthly data, this study covered the period from 2006 to 2010, which will be divided to:

- The period before crisis is from January 2006 to June 2008
- The period from July 2008 until December 2010

3.3. Variables used in the research

- the monthly average of stock price
- Index to measure stock liquidity $= (TV / ACP) / 10^8$

where TV :The monthly average value of transactions volume that concluded on the shares

ACP : The average percentage of absolute change in the price during the same period.

Cooper et al. (1985) used this indicator ,since The rise of this indicator means that the big volume of trading do not result in significant change in the market value of the stock , increase in this indicators mean high liquidity of the stock, but decrease in this indicators means low in liquidity. **Also Mahran (2011)** showed that this liquidity indicator has significant effect on prices (throw period 2004 to 2009)

3.4. Statistical approach of the research

This study used Paired-Sample T-Test as statistical approach to analyze the null hypothesis assuming that there is no significant difference between prices or liquidity before and after global crisis in the different sectors at a significant 5%. In the case of large sample (greater than 30) this test requires is not required to be applied for data Withdrawn from the normal distribution.

3.5. Hypotheses

The first hypothesis:

There are no significant differences between the stock's price in Egyptian market Exchange before and after the global crisis at a significant 5%. The hypothesis test as follows:

$$H_0: \mu P1 = \mu P2 \quad \text{SO} \quad H_1: \mu P1 \neq \mu P2$$

$\mu P1$: variable is the average price for the period before the global crisis

$\mu P2$: variable is the average price for the period after the global crisis

The second hypothesis:

There are no significant differences between the liquidity of stocks in the Egyptian market Exchange before and after the global crisis at a significant 5%. The hypothesis test as follows:

$$H_0: \mu_{L1} = \mu_{L2} \quad \text{SO} \quad H_1: \mu_{L1} \neq \mu_{L2}$$

μ_{L1} : variable represents the average liquidity for the period before the global crisis

μ_{L2} : The average liquidity variable for the period after the global crisis

4. The results and test of hypothesis:

Based on the outcomes of the statistical analysis results for the different sectors, the results showed that there are three types of sectors:-

4.1. Sectors showed a significant difference in both price and liquidity before and after the crisis:

These results are representing in table (2) as following:-

Table (2) show the sectors have significant difference in both price and liquidity

Sectors	mean	correlation	Sig of correlation	T-Test	df	Sig (p-value)
Construction					260	
P Prices before – prices after	400-50	0.8	.000	6.7		.000
Liquidity1 before – liquidity1 after	110-14	0.6	.001	3.27		.001
Cement , Ceramics and the Girl child					194	
Prices before – prices after	141-35	0.7	0.000	3.8		0.000
Liquidity1 before – liquidity1 after	7 - 1	0.8	0.000	2.7		0.020
Spinning and Weaving					144	
Prices before – prices after	66-30	0.64	0.000	7.65		0.000
Liquidity1 before – liquidity1 after	22-8	0.4	0.042	2.6		0.01
Banks & Financial Services					260	
Prices before – prices after	71-47	0.6	0.000	4.178		0.000
Liquidity1 before – liquidity1 after	1413-136	0.5	0.000	3.04		.040
-services sectors					253	
- Prices before – prices after	205-32		0.000	5.34		0.020
Liquidity before -liquidity1 after	210-63	0.52	0.376	1.006		0.03

From the previous table (2), it is clear that the average price has decreased after the crisis compared with the average price before the crisis. These results found in the building and construction sector, cement, spinning and weaving sector financial sector, service sector. Since at significance level 5% the mean difference in prices and liquidity between the two periods (before and after) is equal to zero ($p\text{-value} = .000$), which is very high significance. Consequently the null hypothesis can be rejected, and the alternative hypothesis can be accepted. Also the results proved significant coefficient of correlation between the average price in the two periods (before and after) at the level of significance of 5%, which supports the correct application of this test (where the two periods is independent). In addition the results showed significant difference in liquidity before and after the crisis in these sectors, which is clear from the graphs(1-5) as following:-

Figures . (1-5): sectors have significant difference in both price and liquidity

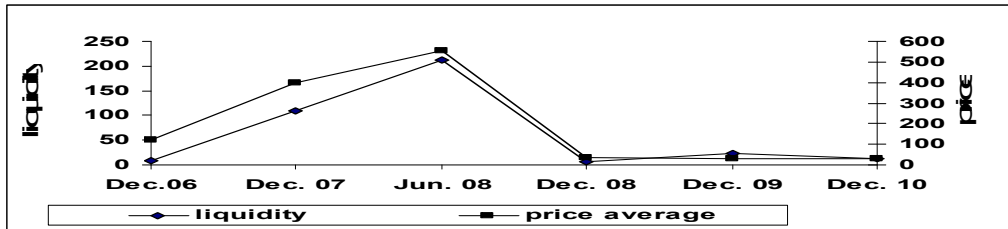


Fig. 1: Construction sector

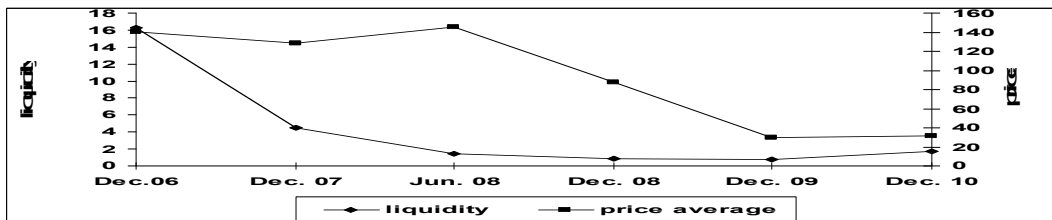


Fig. 2: Cement, ceramics and the girl child sector

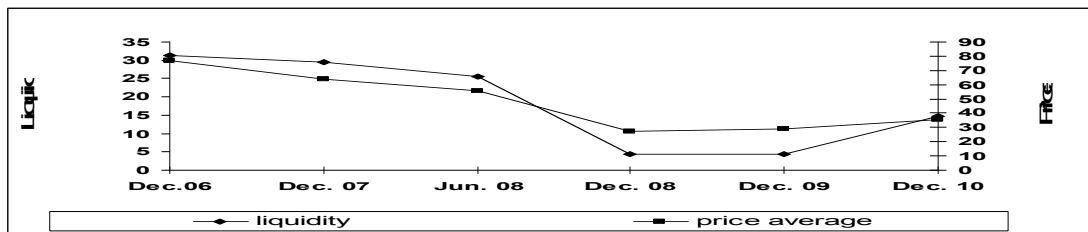


Fig. 3: Spinning and weaving sector

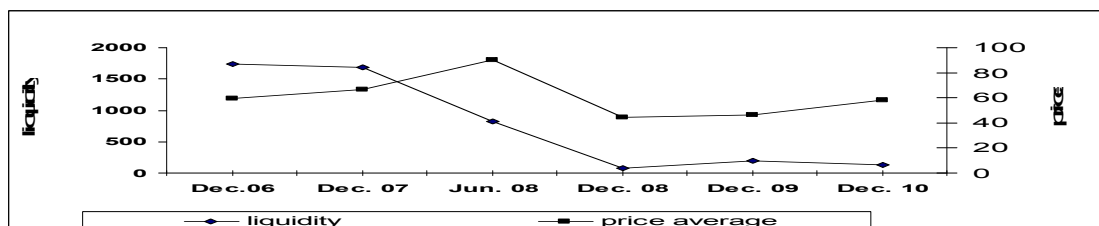


Fig. 4: financial sector

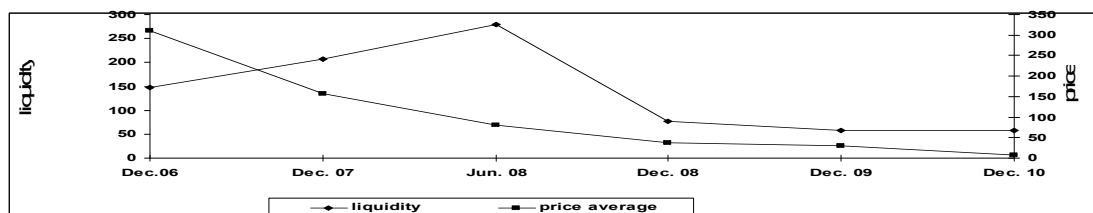


Fig. 5: services sectors

4.2. Some sectors showed a significant difference in the average price but no significant differences in liquidity as evidenced by the following table (3)

From following table (3) the null hypothesis can be rejected- at significant level 5%, where the result shown that p- value is less than (.05) .So there are significant differences in the average price between two period(before and after crisis), which represent in heavy industry, food industry and electronic supplies sectors. Also the results found that the strength of the relationship between prices before and after the crisis .Although the results showed significant decrease in stocks' prices after crisis , there was no significant difference of liquidity between two period(before and after crisis), so the null hypothesis can be accepted for liquidity- at significant level 5%, where the p- value is greater than (.05) . The impact of the crisis on the prices of these sectors was less than its effect on those sectors in the first group (4.1) that were representing significant decreases in both price and liquidity. Which is evident from the following table(3) and Fig. (6-8).

Table (3) sectors have significant difference price but did not show significant liquidity

Sectors	mean	correlation	Sig of correlation	T Test	df	Sig T p- value
Heavy industry					107	
- Prices before – prices after	336-235	0.963	0.000	7.584		0.000
-Liquidity before - liquidity after	25-11	0.3	0.437	1.810		0.070
food industries					188	
-Prices before – prices after	66-24	0.51	0.000	3.65		0.000
-Liquidity before –liquidity after	24-17.3	0.132	0.069	1.63		0.100
electronic and electrical sector						
- Prices before – prices after	90-62	0.765	0.000	2.8	55	0.007
-Liquidity before –liquidity after	87-63	0.02	0.202	0.632		0.53

Figures. (6-8): sectors have significant difference in price but not significant in liquidity

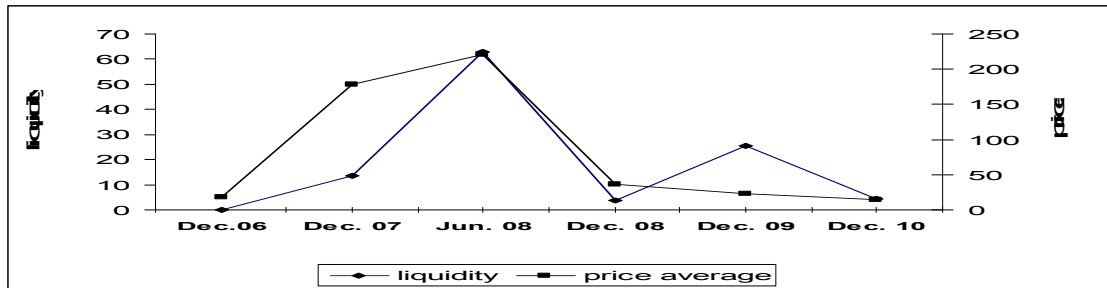


Fig. 6: Heavy industry and

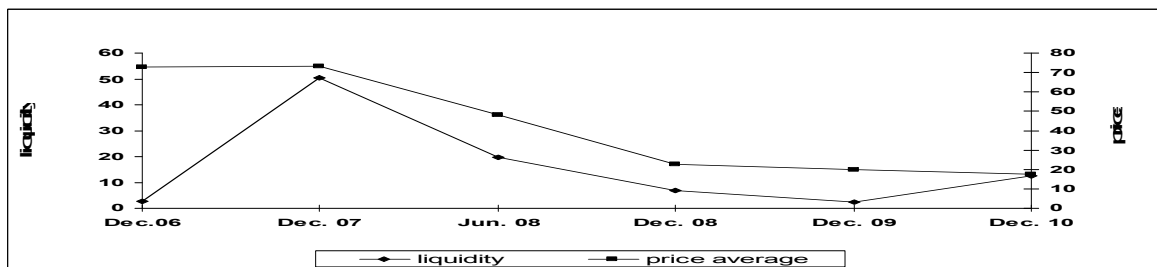


Fig. 7: food industries

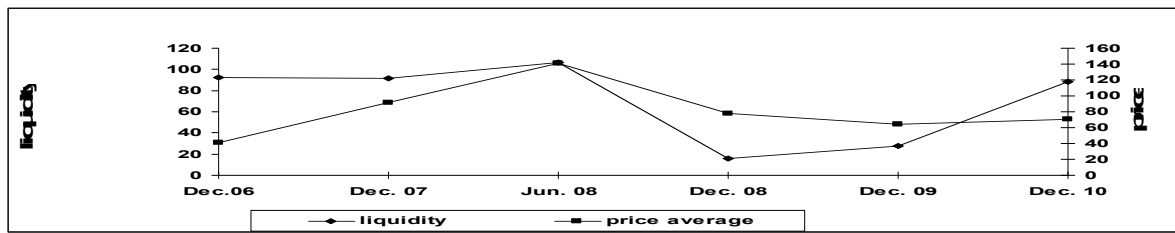


Fig. 8: electronic and electrical sector

4.3. Sectors showed no significant differences in both price and liquidity as evidenced by following table(4).

Table (4) sectors have no significant differences in both price and liquidity

Sectors	mean	correlation	Sig	T-Test	df	Sig p-value
-Agriculture	32 -50	0.02			109	
Prices before – prices after	0.5 -2.5		0.834	.701		0.485
Liquidity before -liquidity after			.07	1.03		0.305
- mills					220	
Prices before – prices after	66-90	0.4	0.033	4.033		0.000
Liquidity before- liquidity after	2.8 -5.6	0.06	0.5	0.044		0.96
-chemical industries					217	
Prices before – prices after	84-67	0.2	0.003	1.9		0.05
Liquidity before -liquidity after	0.75-0.34	0.357	0.000	1.09		0.277

From the previous table(4), the null hypothesis can be accepted- at significant level 5%, where the result shown that p- value is greater than (.05) .So there are no significant differences in both average price and liquidity between two period(before and after crisis), which representing in agriculture, and chemical industries . The results found that in the agriculture sector has increased by both price and liquidity after the global crisis but did not prove significant .This rise in agriculture sector, may be due to the food crisis that accompanied the global financial crisis and increased demand for agricultural products ,which cause rising in the prices of agricultural products . Instead of adding mills sector to the second group above as it showed significant difference in price and no significant difference in liquidity. I'd rather prefer to leave it among the third group since it has an organic relationship with agriculture sector. That was the mean reason for both mill and agriculture sectors to achieve increasing in price after crisis. This results chow in the following Fig (9-11):-

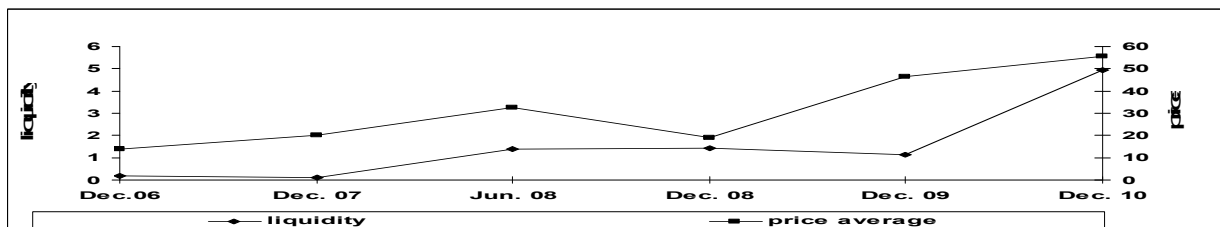


Fig. 9: Agriculture sector

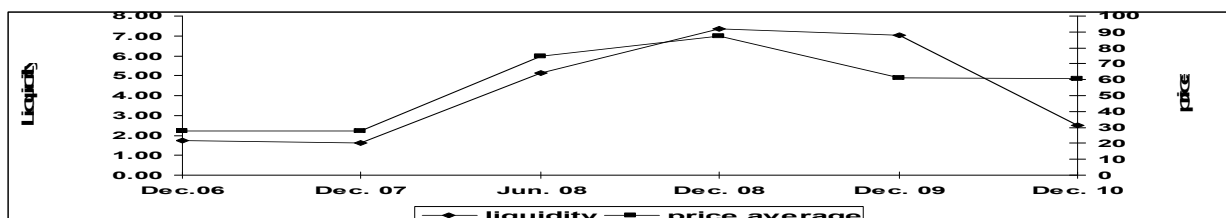


Fig. 10: Mills sectors

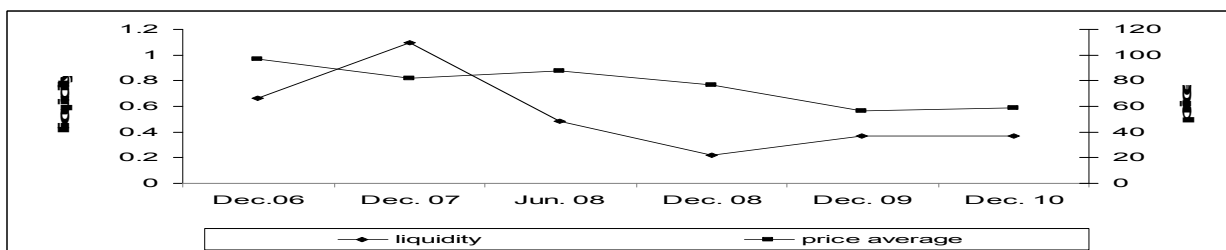


Fig. 11: chemical industries

5. Conclusion

The object of this study is to analyze the impact of the 2008 global crisis on prices and liquidity of stocks in the Egyptian stock market, by using Paired-Sample T-Test as statistical approach. The results showed that there are three types of sectors. First, sectors showed a significant difference in both price and liquidity before and after the crisis. This sectors are most affected by the global crisis, such as building and construction sector, cement, spinning and weaving sector financial sector and service sector. Since the mean difference in prices and liquidity between the two periods (before and after) was equal zero ($p\text{-value} = 0.0000 < .05$) at significance level 5%. While some sectors showed a significant difference in the average price but no significant differences in liquidity, such as heavy industry, food industry and electronic supplies sectors. Although this sectors represent decrease in their price, they less effected by global crisis than the first group of sectors, which showed a significant difference in both price and liquidity. In addition there are some sectors showed no significant differences in both price and liquidity between two period (before and after crisis) such as agriculture, and chemical industries. While the results found that agriculture sector has increased in both price and liquidity after the global crisis but did not prove significant. This rise in agriculture sector, may be due to the food crisis that accompanied the global financial crisis and increased demand for agricultural products, which cause rising in the prices of agricultural products . Also mills sector showed significant increased in price after the crisis, which may be due to the organic relationship between mill and agriculture sectors. Finally this paper focuses on how the global crisis affected the different types of economic sectors in the Egyptian stock market. Also how the infection spreads from the financial crisis in the markets of developed countries to the financial markets in developing countries, which is consistent with the results of previous studies conducted in developing countries.

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